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Portfolio Management, Equity and Real Estate

Abstracts of Required Readings and LOs (2003 CFA II)

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Note to Candidates: You will need to refer to the Learning Outcomes in your Study Guide for wording of each LO. I have provided you with comments on each LO in each study session, but have not duplicated the LOs in these notes.

by

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Study Session 8, "Asset Valuation: Basic Valuation Concepts"
Stowe, Robinson, Pinto and McLeavey, Analysis of Equity Investments: Valuation, "Forward," by
George H. Troughton

LOs
a) Graham and Dodd proposed that investment in common stocks was a serious business requiring "orderly, comprehensive, and critical analysis of a company's income account and balance sheet." John Burr Williams elaborated on the then-arcane financial technique called discounting. Williams argued that a share of common stock had an intrinsic value that could be estimated by calculating the present value of all future dividends per share.

b) MPT recognized that investors must consider the risk of a security as well as its growth prospects. Furthermore, not all risk was equal—some of it could be diversified away by holding assets that had a weak correlation with other assets in an overall portfolio

c) All valuation models are based on the concept of earning power of the company.

Stowe, Robinson, Pinto and McLeavey, "Equity Valuation Process," Ch. 1.

LOs
a) Valuation is the estimation of an assets' value based either on variables perceived to be related to future investment returns or on comparisons with similar assets. Valuation models are used to select stocks, infer market expectations, evaluate corporate events, render fairness opinions, evaluate business strategies and models, communicate with analysts and shareholders, and apprise private businesses (page 3)

b) The manager must translate expectations into value estimates, so that securities can be ranked from relatively most attractive to relatively least attractive (pg 6).

c) Ex ante alpha = expected holding-period return – required return, Ex post alpha = Actual holding-period return – contemporaneous required return.

d) Top-down analysis involves moving from the international and national macroeconomic forecasts to industry forecasts and then to individual company and asset forecasts. Bottom-up is aggregation of individual company forecasts of analysts into industry forecasts, and finally into macroeconomic forecasts.

e) Quantitative factors mostly depend on accounting and economic data. Qualitative factors determine the reliability of the input.

f) See Example 1-3, page 12

g) Careful scrutiny and interpretation of footnotes to accounting statements, and of all other relevant disclosures, is essential to a quality of earnings analysis.

h) Going-concern assumes company will maintain it s business activities into the foreseeable future. Not-going-concern assumes company will stop operations at some point in the relatively near future.

i) An absolute valuation model is a model that specifies an asset's intrinsic value. A Relative valuation model specifies an asset's value relative to that of another asset.

j) Ownership perspective could mean either pride of ownership in research reporting or in the control premium of the stock's estimated price.

Peterson and Peterson, "Company Performance and Measures of Value Added," pp. 1-47.

In this reading, the authors primarily discuss the traditional and newly developed company performance evaluation techniques like economic value added (EVA) and market value added (MVA). They also relate these new performance methods to traditional capital-budgeting techniques.

The key point when evaluating a firm's performance is whether the management's investment decisions as a whole are producing value for the shareholders. Traditional capital-budgeting analysis considers the direct cost of investment and the cost of capital when making the cost-benefit analysis of a project. Net Present Value (NPV) method is one of the most commonly used technique, which discounts uncertain future cash flows at some rate that reflects the cost of capital used in the investment. If the NPV is positive the investment will likely add value to the firm; if the NPV is negative, the investment will likely reduce the value of the firm. Another technique is Internal Rate of Return (IRR). If the project's IRR exceeds the cost of capital, the project is expected to add value to the firm. If the IRR is negative, the project is expected to reduce the value of the firm. However, there are some drawbacks of these methods: no one can (1) perfectly forecast future cash flows from investments, (2) calculate the risk of each investment, and (3) predict precise cost of capital.

There are two primary traditional performance evaluation techniques: Return on Investment (ROI) ratios and Tobin's q ratio. ROI ratios are as follows: (1) basic earning power ratio represents how well the firm uses its assets in its operations, which is the ratio of earning before interest and taxes to total assets. (2) The return on assets ratio shows the return available to owners from the investment of capital from both creditors and owners, which is the ratio of net income to total assets. (3) Return on equity ratio represents the ratio of the net income shareholders receive to their equity in the stock, which is the ratio of net income to book value of equity.

Higher ratios represent the better performance. However, they should be compared with other firms in the same industry or with a benchmark. There are some drawbacks using these ratios: these ratios are (1) sensitive to the choice of accounting methods, (2) use the financial data that represent an accumulation of monetary values from different time periods, (3) backward looking, not forward looking, (4) fail to consider risk, (5) only reflects the bottom line and do not consider the factors outside the management's control. (Know these weaknesses for exam).

Tobin's q ratio: this is considered as a measure of the real value created by a firm's management. The main difference of q ratio from other traditional measures of performance is that it includes the firm's intangible assets. This means that q is more forward looking ratio in terms of anticipating a firm's future cash flow generation capability. The q value is the ratio of the market value of assets to replacement cost of those assets. However, the estimation of replacement cost of assets is quite difficult. An easier and related ratio is book value of equity to market value of equity. Firms with a high Book Value to Market Value (BV/MV) ratio tend to have higher future returns than firms with low BV/MV ratios. Fama and French find that BV/MV explains security returns better than both beta and size.

Currently, analysts are going beyond the traditional performance evaluation techniques and using new value-added techniques. The most common techniques developed are Economic Value-Added (EVA) and Market Value-Added (MVA). As oppose to traditional Net Present Value technique, which examines whether a specific project adds value to firm, EVA and MVA focus more on an estimate of the

change in the value of the <u>whole firm</u> and help us to determine how well management performed in their decision made during a period.

EVA represents the firm's economic profit, which is basically the difference between revenues and costs, where the costs include not only expenses but also the cost of capital. Accounting profit is the difference between revenues and costs, based on the representation of these items according to accounting principles.

When estimating economic profit, (1) calculate the firm's operating profit from financial data, making adjustments to accounting profit to reflect a firm's results for a certain period. There are two approaches to calculating Net Operating Profit After Tax (NOPAT): (a) Bottom-up approach and (b) Top-down approach.

When using the Bottom-up approach, you have to make adjustments to operating profit after depreciation and amortization by adding implied interest expense on operating leases, increase in LIFO reserve, goodwill amortization, increase in bad-debt reserve, increase in net capitalized research and development, and then subtract the cash operating taxes. (2) calculate the capital. There are again two approaches to calculate the capital: Asset approach and Source of financing approach. If you use the asset approach, you need to make adjustments to Net operating assets by adding LIFO reserve, net plant and equipment, other assets, goodwill, accumulated goodwill amortization, present value of operating leases, bed-debt reserve, capitalized research and development, cumulative write-offs of special items. (3) calculate the cost of capital. The cost of capital is described as the cost of raising additional funds from debt and equity sources. First, determine the cost of debt and stock separately, and then calculate the firm's cost of capital as a weighted average of each cost. (4) compare the NOPAT with the cost of capital. The difference between NOPAT and the cost of capital is the estimate of the firm's economic profit, or economic value-added.

1. Economic capital = shareholders' equity
+goodwill written off
+capitalized cumulative unusual loss
+deferred tax
+minority interests
+total debt
Economic capital
2. Net operating profit after tax (NOPAT) = operating profit
+interest expense
-unusual gain
-taxes
NOPAT
3. Weighted average cost of capital (WACC)
Cost of equity (from CAPM)
Cost of debt (from YTM of current bonds outstanding)
WACC
4. EVA = NOPAT – (Economic capital x WACC)

Chances are low that you will see a detailed calculation on the exam. But if you do, think about including all accounts that you believe should produce a return on invested capital into the category of

economic capital. For the NOPAT, include only those revenue and expense items that are directly related to operating profit (not financial items like interest and taxes, and unusual gains). Finally, calculate the WACC in the traditional way using the CAPM and YTM on outstanding bonds. A grader will not mark your answer wrong if it is reasonable and you give some justification for what you do.

Another value-added performance measurement method is Market Value added, which is a measure of what the firm's management has been able to do with a given level of resources. MVA focuses on market value of capital instead of cost of capital. By looking at the change in the MVA over a period, you can determine how effectively the firm's management uses capital to enhance its value for all suppliers of capital, not just for common shareholders. To calculate MVA, you would (1) calculate the market value of capital, (2) calculate the capital invested. MVA is the difference between the market value of capital and the amount of capital invested.

Capital	1993 (millions)	1992 (millions)	Change from '92 to '93
Market Value of Debt and Equity	$6	$5	$1
Less: Invested Capital	$3	$2.5	$.5
MVA	$3	$2.5	$.5

This example shows that management has increased market value added in 1993 by adding $.5 more in market value in excess of invested capital. Note that you are interested not only in MVA, but also in the change in MVA from period to period.

The main difference between EVA and MVA is that EVA equals revenues minus costs using accounting data adjusted to better reflect economic reality, whereas MVA equals market values minus book value of invested capital. Thus, MVA is a more forward-looking estimate of performance than economic profit. The problem with EVA is that accounting data can lead to different conclusions since different analysts can interpret the data differently. Another problem with EVA is using the Capital Asset Pricing Method to calculate the cost of equity. CAPM has its own problems like estimates of the market risk problem and use of historical data.

An alternative method to economic profit, EVA, is CFROI, which is a kind of IRR measure. The difference between CFROI and IRR is that CFROI uses cash flows and investments stated in monetary units. Steps to calculate CFROI are as follows: (1) calculate the life of assets, which is the ratio of the gross plant assets divided by the depreciation, (2) calculate the gross cash-flow, which is obtained by making some adjustments to net income after tax but before extraordinary items. These adjustments are the addition of depreciation and amortization, interest expense, operational rental expense, deferred taxes, tax benefit from special item, and subtraction of the special item, (3) calculate the gross cash investment, which is the summation of book assets like accumulated depreciation and the value of operating leases not presented in financial statements, (4) calculate the terminal value, which is the sum of non-depreciating assets like land, networking capital and other assets, (5) solve for the rate of return (CFROI). <u>CFROI is described as the return that equates the gross cash investment with the sum of the present value of the annual gross cash flow and the present value of the terminal value</u>, (6) compare the CFROI with a benchmark. The primary advantage of CFROI over traditional methods is that it provides the performance in return-on-investment terms instead of in dollar terms, and uses cash flows instead of accounting income. However, when you are using CFROI, you need to state the results in current-dollar terms.

The authors empirically show that both traditional and value-added measures are highly correlated with stock returns. The MVA and EVA are only slightly more correlated with stock returns than the traditional measures and thus may not be better indicators of performance than traditional measures.

LOs
a) <u>Traditional capital-budgeting analysis</u> considers the direct cost of investment and the cost of capital when making the <u>cost-benefit analysis of a project</u>. Net Present Value (NPV) method is one of the most commonly used technique, which discounts uncertain future cash flows at some rate that reflects the cost of capital used in the investment. If the NPV is positive the investment will likely add value to the firm; if the NPV is negative, the investment will likely reduce the value of the firm. Another technique is Internal Rate of Return (IRR). If the project's IRR exceeds the cost of capital, the project is expected to add value to the firm. If the IRR is negative, the project is expected to reduce the value of the firm.

b) There are three return on investment ratios; (1) basic earning power is the ratio of earnings before interest and taxes to total assets, (2) return on assets is the ratio of net income to total assets, (3) return on equity is the ratio of net income to book value of equity. Tobin's q ratio is the ratio of the market value of assets to replacement costs of assets. Higher ratios represent the better performance. However, they should be compared with other firms in the same industry or with a benchmark. There are some drawbacks using these ratios: these ratios are (1) sensitive to the choice of accounting methods, (2) use the financial data that represent an accumulation of monetary values from different time periods, (3) backward looking, not forward looking, (4) fail to consider risk, (5) only reflects the bottom line and do not consider the factors outside the management's control.

c) The main difference between EVA and MVA is that EVA equals revenues minus costs using accounting data adjusted to better reflect economic reality, whereas MVA equals market values minus book value of invested capital. Thus, MVA is a more forward-looking estimate of performance than economic profit. Economic profit is analogous to NPV in that both compare revenue to costs, and both use a weighted average cost of capital. EVA, however, does not calculate the present value of revenues like NPV.

d) EVA represents the firm's economic profit, which is basically the difference between revenues and costs. When estimating economic profit, calculate the firm's revenues (operating profit) from financial data, making adjustments to accounting profit to reflect a firm's results for a certain period. When estimating costs, calculate the cost of capital, which is the cost of raising additional funds from debt and equity sources The difference between operating profit and the cost of capital is the estimate of the firm's economic profit, or economic value-added.

Market Value is a measure of what the firm's management has been able to do with a given level of resources. MVA focuses on market value of capital instead of cost of capital. By looking at the change in the MVA over a period, you can determine how effectively the firm's management uses capital to enhance its value for all suppliers of capital, not just for common shareholders. To calculate MVA, you would (1) calculate the market value of capital, (2) calculate the capital invested. MVA is the difference between the market value of capital and the amount of capital invested.

e) CFROI is a kind of IRR measure. The difference between CFROI and IRR is that CFROI uses cash flows and investments stated in monetary units. Steps to calculate CFROI are as follows: (1) calculate the life of assets, which is the ratio of the gross plant assets divided by the depreciation, (2) calculate the gross cash-flow, which is obtained by making some adjustments to net income after tax but before extraordinary items. These adjustments are the addition of depreciation and amortization, interest expense, operational rental expense, deferred taxes, tax benefit from special item, and subtraction of the special item, (3) calculate the gross cash investment, which is the summation of book assets like

accumulated depreciation and the value of operating leases not presented in financial statements, (4) calculate the terminal value, which is the sum of non-depreciating assets like land, networking capital and other assets, (5) solve for the rate of return (CFROI). <u>*CFROI is described as the return that equates the gross cash investment with the sum of the present value of the annual gross cash flow and the present value of the terminal value,*</u> *(6) compare the CFROI with a benchmark.*

f) The key point when evaluating a firm's performance is whether the management's investment decisions as a whole are producing value for the shareholders. Both measures attempt to do this.

g) The main difference between EVA and MVA is that the later uses market values, which are more forward looking estimates of performance than economic profit. EVA is estimated by using accounting data and making necessary adjustments to reach the true value of economic profit. However, accounting data can be differently interpreted by different analysts and lead to different conclusions. Another problem with EVA is using the Capital Asset Pricing Method to calculate the cost of equity. CAPM has its own problems like estimates of the market risk problem and use of historical data.

h) The authors empirically show that both traditional and value-added measures are highly correlated with stock returns. The MVA and EVA are only slightly more correlated with stock returns than the traditional measures and thus may not be better indicators of performance than traditional measures.

i) Market-value-added measures may not be superior to stock returns in measuring corporate performance because of a couple of reasons. First is the size bias. Adding $1 million in value is easier for large firms than for small firms. I addition, market value added (or even the percentage of market value added) does not consider the general movement of the market and the risk of the firm Market-value-added rankings are biased toward large firms (page 45)

Self test question: **Discuss** whether value added techniques measure performance better than traditional techniques.
Suggested answer: Empirically, value added measures and traditional measures are highly correlated. Thus, value-added measures may not be better indicators of performance.

Bernstein and Pigler, Quantitative Viewpoint, "An Analysis of EVA."

LOs
a) EVA is a measure of how much a successful corporation will enhance shareholder value by earning in excess of its cost of capital. EVA equals the difference between NOPAT and the after-tax cost of capital. Companies that consistently generate increasing EVA are creating shareholder value. MVA is the difference between the capital invested in a company and its equity market value. MVA is seen as the present value of all future EVA. As EVA increases, so does MVA and shareholder value.

b) EVA can be used as a criterion for selecting stocks by ranking firms on the basis of EVA. If EVA is a superior measure, stocks of higher ranked firms should outperform stocks of lower ranked firms. The authors did not find evidence to support this hypothesis.

c) Although MVA does outperform the market on an absolute basis, neither EVA nor MVA provide superior risk-adjusted returns versus those of the S&P 500. Other measures do not perform well either. The authors report that reported earnings are what ultimately derive stock prices.

Bernstein, Bayer and Pigler, Quantitative Viewpoint, "An Analysis of EVA—Part II"

LOs
a) Growth in EVA and growth in MVA might be more closely related to future stock performance than strategies based on the based on absolute levels of EVA and MVA since the strategy based on growth is more momentum oriented and the strategy based on absolute levels is more value oriented.

b) Strategies based on EVA and on MVA and strategies based on growth in EVA and growth in MVA is that the former seem to have some characteristics similar to those of value strategies, while the latter seem to have some characteristics similar to those of "momentum" strategies.

Study Session 9, "Asset Valuation: Equity Investments: Industry and Company Analysis"
Porter, Competitive Advantage: Creating and Sustaining Superior Performance, "Competitive Strategy: The Core Concepts"

Competitive strategy is the search for a favorable competitive position in an industry. It aims to establish a profitable and sustainable position against the forces that determine industry competition. The two central questions underlying the choice of competitive strategy are: (1) what is the attractiveness of the industry for long-term profitability and what are the factors that determine that attractiveness, and (2) what are the determinants of the relative competitive position within an industry? The central theme is how a firm can actually create and sustain a competitive advantage in its industry--how it can implement the broad generic strategies.

The Structural Analysis of Industries--:the first fundamental determinant of a firm's profitability is industry attractiveness. The rules of competition are embodied in 5 competitive forces:

1. entry of new competitors
2. threat of substitutes
3. bargaining power of buyers
4. bargaining power of suppliers
5. rivalry among the existing competitors

The collective strength of these 5 forces determines the ability of firms to earn rates of return on investment in excess of the cost of capital all industries are not alike from the standpoint of inherent profitability

These five forces determine industry profitability because they influence the prices, costs and required investment of firms in an industry--the elements of return on investment. In any particular industry, not all of the five forces will be equally important and the particular structural factors that are important will differ. Strategies that change industry structure can be a double-edged sword, because a firm can destroy industry structure and profitability as rapidly as it can improve it.

Often firms make strategic choices without considering the long-term consequences for industry structure. They see a gain in their competitive position if a move is successful, but they fail to anticipate the consequences of competitive reaction

The ability of firms to shape industry structure places a particular burden on industry leaders. a leader, then, must constantly balance its own competitive position against the health of the industry as a whole

Industry profitability is not a function of what the product looks like or whether it embodies high or low technology, but of industry structure: industry structure and buyer needs
- satisfying buyer need is at the core of success
- satisfying buyer needs may be a prerequisite for industry profitability, but in itself is not sufficient. The crucial question is whether firms can capture the value they create for buyers, or whether this value is competed away to others.

Industry structure determines who keeps what proportion of the value a product creates for buyers

Industry structure and the supply/demand balance--another commonly held view about profitability is that profits are a function of the balance between supply and demand. Even though short-term fluctuations in supply and demand can affect short-term profitability, industry structure underlies long-term profitability.

Industry structure determines how rapidly competitor add new supply

The consequences of an imbalance between supply and demand for industry profitability also differs widely depending on industry structure. For example, the presence of powerful suppliers or the presence of substitutes can mean that the fruits of a boom pass to others.

Generic Competitive Strategies--the second question in competitive strategy is a firm's relative position within its industry. There are 2 basic types of competitive advantage a firm can possess: cost leadership, and differentiation, each of which the firm can pursue through 3 generic strategies: cost leadership, differentiation, and focus. The focus strategy has 2 variants, cost focus and differentiation focus. The notion underlying the concept of generic strategies is that competitive advantage is at the heart of any strategy.

Cost leadership--the firm sets out to become the low-cost producer in its industry through: economies of scale, proprietary technology, and preferential access to raw materials

If the firm can achieve and sustain overall cost leadership, then it will be an above-average performer provided it could command prices at or near the industry average

Parity allows a cost leader to translate its cost advantage directly into higher profits than competitors

Proximity in differentiation means that the price discount necessary to achieve an acceptable market share does not offset a cost leader's cost advantage and hence the cost leader earns above-average returns.

Differentiation--in this strategy, a firm seeks to be unique in its industry along some dimensions that are widely valued by buyers. Differentiation can be based on: the product itself, the delivery system by which it is sold, and the marketing approach

A firm that can achieve and sustain differentiation will be an above-average performer in its industry if its price premium exceeds the extra costs incurred in being unique

The logic of the differentiation strategy requires that a firm choose attributes in which to differentiate it that are different from its rivals'

Focus--the focuser selects a segment or group of segments in the industry and tailors its strategy to serving them to the exclusion of others. This strategy may be
- cost focus
- differentiation focus

If a focuser's target segment is not different from other segments, then the focus strategy will not succeed

If a firm can achieve sustainable cost leadership (cost focus) or differentiation (differentiation focus) in its segment and the segment is structurally attractive, then the focuser will be an above-average performer in its industry

Stuck in the middle--is when a firm engages in each generic strategy but fails to achieve any of them

A firm stuck in the middle will earn attractive profits only if the structure of its industry is highly favorable, or if the firm is fortunate enough to have competitors that are also stuck in the middle. Becoming stuck in the middle is often a manifestation of a firm's unwillingness to make choices about how to compete

Pursuit of more than one generic strategy--usually a firm must make a choice among the generic strategies, or it will become stuck in the middle. Achieving cost leadership and differentiation are usually inconsistent, because differentiation is usually costly. There are, however, 3 conditions under which a firm can simultaneously achieve both cost leadership and differentiation:
- competitors are stuck in the middle
- cost is strongly affected by market share or interrelationships
- a firm pioneers a major innovation

A firm should always aggressively pursue all cost reduction opportunities that do not sacrifice differentiation

A firm should also pursue all differentiation opportunities that are not costly

A firm should be prepared to choose what its ultimate competitive advantage will be and resolve the tradeoffs accordingly

Sustainability--the firm should offer a moving target to its competitors by investing in order to continually improve its position

Each generic strategy involves different risks. Hence, each strategy requires that the firm possess some barriers that make imitation of the strategy difficult.

The concept of generic strategies is based on the premise that there are a number of ways in which competitive advantage can be achieved, depending on industry structure.

Generic strategies and industry evolution--changes in industry structure can affect the bases on which generic strategies are built and thus alter the balance among them

Generic strategies and organizational structure--each generic strategy implies different skills and

requirements for success, which commonly translate into differences in organizational structure and culture

Cost leadership usually implies tight control systems, overhead minimization, pursuit of scale economies, and dedication to the learning curve; these could be counterproductive for a firm attempting to differentiate itself through a constant stream of creative new products.

It is equally important to match executive selection and motivation. Generic strategies and the strategic planning process--the centerpiece of a firm's strategic plan should be its generic strategy

In practice many strategic plans are lists of action steps without a clear articulation of what competitive advantage the firm has or seeks to achieve and how

A common practice in strategic planning is to use market share to describe a business unit's competitive position. Market share is not a cause but an effect of competitive advantage. Additionally, it is too difficult for management to define.

LOs
a) There are 2 basic types of competitive advantage a firm can possess: cost leadership, and differentiation, each of which the firm can pursue through 3 generic strategies: cost leadership, differentiation, and focus. The focus strategy has 2 variants, cost focus and differentiation focus. The notion underlying the concept of generic strategies is that competitive advantage is at the heart of any strategy. The five competitive forces that affect the profitability of a firm; (1) the entry of new competitors, (2) the threat of substitutes, (3) the bargaining power of buyers, (4) the bargaining power of suppliers, (5) the rivalry among the existing competitors.

b) The first fundamental question that determines the choice of competitive strategy is the attractiveness of industries for long-term profitability and the factors that determine it. Not all industries offer equal opportunities for sustained profitability, and the inherent profitability of its industry is one essential ingredient in determining the profitability of a firm. The second central question is the determinants of relative competitive position within an industry. In most industries, some firms are much more profitable than others, regardless of what the average profitability of the industry may be.

c) Strategies for achieving a competitive advantage; (1) cost leadership, which is being low cost producer, (2) differentiation, which is pursuing to be unique in some dimensions. The generic strategies are also involves those two basic strategies - cost leadership and differentiation-, and also has a third strategy - focus strategy. Focus strategy has two variations; cost focus strategy and differentiation focus strategy.

d) Risks of cost leadership; (1) cost leadership is not sustained because competitors imitate, technology changes, cost leadership erode, (2) proximity in differentiation is lost (3) cost focusers achieve even lower cost in segments. Risks of differentiation; (1) differentiation is not sustained, (2) cost proximity is lost, (3) differentiation focusers achieve even greater differentiation in segments. Risks of focus; (1) this focus strategy is imitated, (2) the target segment becomes unattractive, (3) broadly targeted competitors overwhelm the segment, (4) new focusers sub-segment the industry.

e) A company can become stuck in the middle. However, in the existence of the following conditions, the firm can simultaneously achieve strategies (1) if the competitors also suck in the middle, (2) if cost is strongly affected by share or interrelationships, (3) if a firm pioneers a major innovation.

f) The role of a generic strategy in the strategic planning process is to specify the fundamental approach to competitive advantage a firm is pursuing, and provides the context for the actions to be taken in each functional area. Generic strategies are cost leadership, differentiation, and focus (see page 113).

Self test question: **Discuss** the two fundamental determinants of a firm's profitability and the forces that impact each. **Explain** the 2 basic types of competitive advantages a firm can possess and the 3 generic strategies for achieving above-average performance in an industry.
Suggested answer: The two fundamental determinants of a firm's profitability are industry attractiveness and the firm's position within the industry. Two basic types of competitive advantages are cost leadership, and differentiation, each of which the firm can pursue through 3 generic strategies: cost leadership, differentiation, and focus.

Self test question: **List** five factors that affect the relative competition of the industry and **identify** each factor as either a supply factor or a demand factor.
Suggested answer: (1) rivalry within the industry (a supply factor), (2) the threat of new entrants (a supply factor), (3) the threat of substitute products (a supply factor), (4) the bargaining power of buyers (a demand factor), (5) the bargaining power of suppliers (a supply factor).

Hooke, Security Analysis on Wall Street: A Comprehensive Guide to Today's Valuation Methods, "Industry Analysis," Ch. 6.

The purpose of this chapter is to review preparing an industry analysis. This chapter is part of the top-down approach organized as follows: (1) introduction, (2) macroeconomic review, (3) relevant stock market prospects, (4) review of the company and its business and industry (topic of this chapter), (5) financial analysis, (6) financial projections, (7) application of valuation methodologies, and (8) recommendations.

Organizing an Industry Analysis. The industry analysis begins with positioning the specific industry within its life cycle. Defining a sector in this way is important on Wall Street. Investors place a premium on simple investment themes. Thus, the faster the analyst pigeonholes an industry into the "life cycle" chart, the better. (see Exhibit 6-1).

Classification by Industrial Life Cycle. The product they produce classifies industries or the service they provide. The industrial life cycle reflects the vitality of an industry over time. (see Exhibit 6-4: be able to briefly discuss each phase on the exam as is done in the exhibit).

Classification by Business Cycle Reaction. Industries are generally classified by their business cycle behavior as: (1) growth—above-normal expansion in sales and profits occurs independent of the business cycle, (2) defensive—stable performance during both ups and downs of business cycle, or (3) cyclical—profitability tracks the business cycle, often in an exaggerated manner.

External Factors. External issues fall into five broad categories: (1) technology where the focus is on fending of perceived substitutes derived from newer technology, (2) government where the biggest challenges are dealing with taxes and regulation, (3) social changes where fashion (most important) and lifestyle are significant factors, (4) demographics where population trends are important, and (5) foreign influences where global trade is important.

Demand Analysis. Demand analysis involves one of three approaches: (1) Top-down economic analysis—you look for specific macroeconomic variables that affect an industry's sales, (2) industry life

cycle—categorizing the industry within its life cycle position provides a framework for demand forecasts, and (3) external factors—many outside factors are fairly stable, and their important on an industry are easily predictable.

Supply Analysis in the Industry Study. The real question is whether supply creates its own demand. Supply is a function of unused capacity and the ability to bring on new capacity. The supply projection is easiest when the industry has only a few competitors, generating output at a discrete number of sizable facilities.

Profitability, Pricing, and the Industry Study. Factors contributing to pricing include: (1) product segmentation, (2) degree of industry concentration, (3) ease of industry entry, and (4) price change in key supply inputs.

International Competition and Markets. The world is becoming a smaller place and industries increasingly reflect a globalization theme. This characterization is most advanced with commodity industries such as oil, metals, and basic foodstuffs, but it also dominates intermediate sectors such as textiles, semiconductors, and chemicals.

LOs
a) First, define where the industry is in its life cycle. Next, define the external factors such as technology and government that affect the industry. Next, define the users' demand for the product. Next, define the supply characteristics such as ease of entry and degree of concentration. Finally, define the profitability in terms of cost and pricing. (see Exhibit 6-3).

b) Cycles: (1) pioneer—undeveloped market, (2) growth—product acceptance, (3) mature—competition comes into industry, and (4) decline—product loses appeal (see Exhibit 6-4).

c) Industries are generally classified by their business cycle behavior as: (1) growth—above-normal expansion in sales and profits occurs independent of the business cycle, (2) defensive—stable performance during both ups and downs of business cycle, or (3) cyclical—profitability tracks the business cycle, often in an exaggerated manner.

d) External issues fall into five broad categories: (1) technology where the focus is on fending of perceived substitutes derived from newer technology, (2) government where the biggest challenges are dealing with taxes and regulation, (3) social changes where fashion (most important) and lifestyle are significant factors, (4) demographics where population trends are important, and (5) foreign influences where global trade is important.

e) Demand analysis involves one of three approaches: (1) Top-down economic analysis—you look for specific macroeconomic variables that affect an industry's sales, (2) industry life cycle—categorizing the industry within its life cycle position provides a framework for demand forecasts, and (3) external factors—many outside factors are fairly stable, and their important on an industry are easily predictable. Supply Analysis in the Industry Study. The real question is whether supply creates its own demand. Supply is a function of unused capacity and the ability to bring on new capacity. The supply projection is easiest when the industry has only a few competitors, generating output at a discrete number of sizable facilities

f) Factors contributing to pricing include: (1) product segmentation, (2) degree of industry concentration, (3) ease of industry entry, and (4) price change in key supply inputs.

g) The world is becoming a smaller place and industries increasingly reflect a globalization theme. This characterization is most advanced with commodity industries such as oil, metals, and basic foodstuffs, but it also dominates intermediate sectors such as textiles, semiconductors, and chemicals.

Reilly and Brown, Investment Analysis and Portfolio Management, 6th ed., "Analysis of Financial Statements," Ch. 12.

Analysis of financial statements consists of a thorough review of key ratios (including the DuPont Model) and an assessment of the quality of the financial information presented in the income statement and balance sheet. To accomplish this, CFA Level I candidates need to know the definitions and computational forms of the financial ratios, be aware of the ways the components of the ratios can change if the underlying accounting choices used to derive them change, understand what each ratio implies about a firm's financial health and performance, and understand the implications of the "quality" of the financial data.

Basic generally accepted accounting principles (GAAP) are reviewed briefly in this chapter in Table 12.1 This review supplements information about these principles found in other candidate readings. They are: revenue recognition guidelines; accounts receivable write off policies; inventory measurement alternatives; valuation of investments in securities methods; and depreciation options.

The primary focus of this reading is a discussion of the ratios useful to financial analysts. The *liquidity ratios* (current, quick, cash, receivables turnover, inventory turnover, and cash conversion cycle) are listed and illustrated. Liquidity ratios provide information about a firm's ability to meet its future short-term financial obligations. The total asset turnover, net fixed asset turnover and equity turnover ratios are shown as examples of measures of *operating efficiency*, or how well management is utilizing its assets and capital. *Operating profitability* is measured by the gross profit margin, operating profit margin, net profit margin, return on total capital, return on owner's equity and the DuPont system, which breaks down return on equity into several related components. Financial risk is measured using the debt/equity ratio, long-term debt/total capital ratio, and total debt ratio. Earnings and cash flow ratios (interest coverage, total fixed charge coverage, cash flow to interest expense, cash flow coverage, cash flow to long-term debt, cash flow to total debt) and alternative measures of cash flow are explained and their usefulness cited.

The explanation of the DuPont system is perhaps the single most important part of this reading. The CFA Level I exam will very likely have a question or questions on the DuPont model (either explicitly or implicitly). Candidates should understand the DuPont Model is comprised of five components: operating profit margin, total asset turnover; interest expense rate; financial leverage multiplier; and tax retention rate.

Risk analysis, in the form of business risk and financial risk is explained and the analysis of growth potential illustrated. The differences in financial statement analysis when statements of different countries are introduced, and a good listing of the basic accounting differences from several major countries are presented in table form. The learning outcomes do not list international differences as one of the objectives of this reading. It is unlikely that questions from pp. 411–417 will be on the exam.

This reading concludes with a brief discussion of the "quality" of earnings. The importance of the choice of accounting methods is repeated. The primary contribution of this reading, however, is the focus on ratio calculation and interpretation and the illustration of the DuPont Model.

LOs

a) Recognizing the amount and timing of (1) revenues, uncollectible accounts, inventory, investment in securities, and depreciation are just a few important choices.

b) Different companies may and most likely will use different accounting principles. For example, one firm may use LIFO and another use FIFO. Both are quite acceptable.

c) Cash flow from operating activities adjust each item on the balance sheet and income statement for actual cash in or out of the firm. Cash from operations usually means net income plus non-cash items such as depreciation. Free cash flow modifies cash flow from operations to recognize that some investing and financing activities are critical to the ongoing success of the firm.

d) Common size ratios express all balance sheet items relative to assets and all income statement items relative to sales. Internal liquidity measures indicate the ability of the firm to meet future short-term obligations. Operating efficiency measures show how management uses its assets and capital. Operating profitability measures profits as a percentage of sales and assets. Business risk is the uncertainty of income causes by the industry within which the firm operates. Financial risk is the uncertainty of returns to the stockholders due to the use of leverage. Growth measure show how fast the firm can grow, and external liquidity is how quickly the firm can convert assets into cash. Be sure you can calculate all these ratios (see 381-408 in text).

e) ROE = Net Income/Common Equity = Net Income/Net Sales x Net Sales/Total Assets x Total Assets/Common Equity. This three-way decomposition says ROE equals profit margin x Total Asset Turnover x Financial Leverage. A five-way decomposition says ROE = NI/EBT x EBT/EBIT x EBIT/Sales x Sales/TA x TA/Equity. Reilly and Brown present a slightly different method, but both are equivalent. Be sure to study their way, also (see page 402).

f) Business risk is the uncertainty of income caused by the firm's industry that, in turn, is due to the firm's variability of sales caused by its products, customers, and the way it produces its products. Business risk is usually measured by the variability of the firm's operating income over time. Business risk = Standard deviation of operating earnings / Mean operating earnings. Financial risk is the additional uncertainty of returns to equity holders due to a firm's use of fixed obligation debt securities. The acceptable level of financial risk depends on the firm's business risk. If the firm has low business risk, investors are willing to accept higher financial risk. Several balance sheet ratios (i.e., D/E), income statement ratios (i.e., TIE), and cash flow (i.e., cf/long-term debt) can be used to measure financial risk (see pages 404-412).

g) Trend analysis (same firm's ratios over time) and cross-sectional analysis (firm's ratios relative to firms in same industry or within the overall market) are common techniques. Analysts use both techniques (see Table 12.9, pg 416).

h) The major challenge is to adjust all data to common accounting principles. An ROE ratio in Japan may not be the same as a quick ratio in USA.

i) Stock valuation relies on P/E and ROE. Bond ratings on TIE, and bankruptcy mostly on declining liquidity and profitability.

j) Questions include: same accounting treatments? Same divisions in two different firms? Same time frame? Health of industry?

Comment: You should be able to calculate the major categories of financial ratios and discuss their uses; calculate and interpret measures of a company's internal liquidity, operating performance, risk profile, growth potential, and external liquidity; calculate the various breakdowns for the company's return on equity within the traditional and extended DuPont systems; calculate and interpret a company's financial ratios relative to its industry, to the aggregate economy, and to the firm's own performance over time; interpret common-size balance sheets and common-size income statements and identify when it is appropriate to use them; and identify and discuss the limitations of financial ratios (e.g., differences in accounting treatment among companies)

Reilly and Brown, "Company Analysis and Stock Selection," Ch. 20, pp. 792-852.

The purpose of this chapter is to extend the top-down analysis began in chapters 16 (market) and 17 (industry) to the company. The same two-step procedure is used to estimate future earnings and future earnings multiple. This is called the earnings multiple approach. Multiplying the future earnings estimate and the future earnings multiple estimate gives an expected future price one year into the future. Given an estimated future price you can calculate an expected holding period return E(R). Remember that E(R) = (future price - current price + future dividends) / current price. Compare the E(R) to the required rate of return (k) to determine your investment action. If E(R) > k, buy the stock; if E(R) < k, do not buy the stock or sell it if you already own it. If E(R) = k, the stock is efficiently priced. The author does not call the difference alpha, but that is what it is [alpha = E(R) - k]. Be sure to recognize that the type of company and the type of stock are not the same thing since the stock of a good company may be overvalued. Also remember that you can calculate E(R) using the dividend discount model where E(R) = D1 / Po + g.

Estimating earnings per share.
- Estimate company sales using a relatively stable historical relationship between company sales and some industry economic series such as industry sales (remember that you need an industry sales forecast)
- Estimate company profit margin again using a relatively stable historical relationship between company profit margin and the industry profit margin (remember that you need an industry profit margin forecast)
- Estimate earnings per share by multiplying company sales forecast by company profit margin forecast and dividing by the number of shares outstanding.

Estimating earnings multiple
Macro: Estimate company P/E ratio using a relatively stable historical relationship between company P/E and either the industry or market P/E ratio (remember that you need an industry or market P/E forecast)

Micro: Alternatively, you could estimate company P/E ratio using estimates of D/E, k and g. Remember that P/E = (D1/P) / k - g where (D1/P) = dividend payout ratio, k comes from the CAPM and g = ROE x retention rate.

Additional measures of relative value:
1. relative P/B ratio: compare P/B ratio of company to market P/B ratio and evaluate relative to historical value. If ratio is greater than one and it has historically been less than one, then this suggests an overvalued stock, and vice versa.
2. relative P/Cash Flow: same logic
3. relative P/E: same logic

Growth analysis—remember that the dividend discount model is not a good model for growth companies since these types of companies may not be paying dividends. Growth means that the company has the opportunity to invest in projects that generate rates of return greater than the firm's cost of capital. Some analysts say a growth stock is one that is growing faster than average (remember that the average growth in the U.S. has been around 7-8% according to Ibbotson data: total return about 11-12% and average dividend yield around 4% gives average growth around 7-8%).

No-growth model—dividends equals earnings meaning Po = E/k or k = E/P (author uses V instead of P).

Simple growth model—V = E/k + present value of excess earnings from growth investments.

Factors affecting growth (common sense):
1. retention rate
2. rate of return on earnings retained
3. time period (duration) growth persists

Alternatives: Given a growth estimate, you could use the relative P/E ratio to solve for how long the market expects growth to persist, and then you could evaluate the merits of this estimate. For example, the relative P/E model may suggest high growth will last 6 years. You would then ask yourself if this length of time is reasonable. A problem with this approach is that the company you are evaluating may have different risk than the market. Remember that typically, high growth stocks have high P/E ratios since the market is betting on future growth.

Final comment: Using an electronic spreadsheet, you could conduct sensitivity analysis for a multi-stage growth model to determine if the current price of the stock falls within a reasonable range of values derived from the multi-stage growth model.

LOs
a) Estimating future earning per share (EPS); (1) estimate company sales from historical data, (2) estimate company and industry profit margin, (3) estimate the EPS by multiplying the findings in step 1 and step 2, and divide it by the number of shares outstanding. Estimating earning multiplier--there are two ways; (1) estimate Price-to-Earnings ratio (P/E) using historical data and industry P/E data, (2) estimate P/E using the estimates of Debt-to-Equity ratio, required return and growth rate in the constant dividend growth model. Future value of company shares; multiplying the future earning estimate and the future earning multiple gives an expected future price one year into future. Multiplying estimated future price with number of shares outstanding gives estimated market value of company.

b) There are three main techniques that analyst use: (1) comparing Price-to-Book ratio (P/B) of company to market P/B and evaluate relative and evaluate relative to the historical value; if ratio is greater than one and it has historically less than one, then this suggests an over valued stock, and vice versa, (2) relative Price-to-Cash Flow-same logic applies, (3) relative P/E ratio-same logic applies.

c) The P/E ratio can provide valuable information in terms of whether stock is overvalued or undervalued. In addition to P/E ratio, P/BV and P/CF are considered to be good supplements (see Table 20.4, pg. 804).

d) EVA is an evaluation of internal performance. MVA is a measure of external performance—how the market has evaluated the firm's performance in terms of the market value of debt and market value of equity compared to the capital invested in the firm. The franchise factor is similar to EVA since it

recognizes that, to add to the value of a firm, it is necessary to invest in projects that provide excess NPV—i.e., the firm must generate rates of return above its WACC.

e) Dividend Discount Model (DDM) assumes that dividends are expected to grow at a constant rate but in the company case, there may not be dividend payment. Instead, dividends usually reinvested to finance the operations.

f) (1) no-growth firm model assumes that company generates constant stream of earnings because the asset base and rate of return never changes, and therefore value of firm never changes, (2) long-run growth models assume that some of the earnings are reinvested, (3) simple growth model assumes that the firm has investment opportunities, which provide rates of return equal to return on investments, (4) expansion model assumes that a firm retains earnings to reinvest but receives a rate of return on its investments that is equal to its cost of capital, (5) negative growth model applies to a firm that retains earning and reinvests these funds in projects that generate rates of return below the firm's cost of capital.

g) Project dividends assuming either constant or variable growth infinitely (actually a 20-year projection is probably good enough since the present value beyond 20 years is rather small), and calculate the present value of those dividends. This is the intrinsic value of the stock. Compare this to the actual market value to determine whether the stock is under-valued or over-valued. Note that this procedure should provide the same conclusion from comparing the expected rate of return to the required rate of return.

h) (1) analyze the earnings per share of company, (2) examine the profitability based on Return-on-Equity (ROE) and financial strength based on Debt-to-Equity (D/E) ratios for industry firms, (3) understand the differences among countries in terms of P/E, P/B ratios due to different accounting systems, (4) consider the exchange rate risk when evaluating the share price performance of an individual company.

Self test question: **Explain** how you would use a relative P/E ratio to determine if a stock is properly priced.
Suggested answer: Assuming the stock has the same risk as the market, a relative P/E ratio greater than 1 implies overvaluation, and a ratio less than one implies undervaluation.

Study Session 10, "Asset Valuation: Equity Investments: Valuation Models"
Stowe, et al., Analysis of Equity Investments: Valuation, "Discounted Dividend Valuation," Ch. 2.

LOs
a) Advantage of the DDM is that stockholders receive dividends. The disadvantage is that a company may not pay dividends. Advantage of free cash flow (adjusting for capital expenditures) is that this measures what the company can afford to pay as dividends and it is available for viewing. The disadvantage is that some companies have intense capital needs that create negative FCF well into the future. Advantage of residual income is that it is applicable when company does not pay dividends or FCF is negative. Disadvantage is its complexity and requirement of detailed knowledge of accrual accounting.

b) The DDM is appropriate when company pays a dividend that is consistent to the firm's earnings, and when investors take a non-control perspective.

c) The CAPM approach states that the required rate of return is a function of beta(see example 2-3, page 49). The APT states that the required return is a function of multiple risk premiums (see Executive summary for discussion and example 2-4, page 53). The bond yield pus risk premium approach is quick and easy, but is not available for companies without publicly traded debt (see example 2-5, page 54).

d) The Gordon growth model equity risk premium equals k minus Rf, or Equity Risk Premium = (D1/P + g) – Rf, where Rf is the current long-term government bond yield.

e) Limitations of the CAPM and APT to estimating k are their assumptions. Do they hold in practice? Probably not!

f) The build-up approach is the sum of Rf plus subjectively estimated risk premiums.

g) The expected holding-period return equals the dividend yield plus the expected price appreciation.

h) The expected holding period return is what you expect given the stock's current price. The required rate of return equals what you require given an estimate of the requirement using some theoretical model such as the CAPM or APT.

i) The convergence between price and value means an excess return is no longer available (alpha equals zero).

j) The DDM finds the value of stock as the sum of the present values of the expected dividends over the holding period plus the present value of the expected stock price at the end of the holding period.

k) Gordon's growth model: Vo = D1/ (r – g), assuming constant growth in dividends forever.

l) Gordon's growth model says g = r – (D1/Po) or r = (D1/Po) + g

m) Leading P/e ratio (pg 69) = (D1/E1) / (r – g) = (1 – b) / (r – g), where b = retention ratio. Trailing P/e = [(1 - b)(1 + g)] / (r – g). Leading refers to projected earnings and trailing to past earnings.

n) A fixed-rate perpetual preferred stock (pg 65) w/g = 0, Vo = D/r. r is called the capitalization rate since it capitalizes D

o) Present Value Growth Opportunities (PVGO pg 68) is the part of a stock's total value that comes from profitable future growth opportunities, in contrast to the stock's value associate with assets already in place. Thus, PVGO = Vo – E/r. Note E is earnings, not dividends.

p) Strengths is that it can be used to value stable-growth, dividend-paying companies, broad-based equity indexes, it is simple to use, and can be used to determine expected rate of return given efficient prices. Limitations of Gordon growth model include that calculated values are sensitive to small changes in r or g, it is not applicable to non-dividend paying stocks, and is inapplicable to unstable – growth, dividend-paying stocks.

q) The assumptions of the two-stage model are either constant growth in each stage or declining growth in the first stage with constant growth in the second stage with second stage growth lasting forever.

r) The growth phase is expanding markets, transitional phase is when growth slows as competition enters market, and mature phase is when investment returns just equal required rate of return.

s) Terminal value can be estimated using either a price multiple of some fundamental variable such as earnings, or by applying Gordon's growth model.

t) Calculation examples for the two-stage (Ex. 2-18 and 2-19, pg 75), for H-model (Ex. 2-20, pg 77), and for 3-stage (Ex. 2-21 and 2-22, pgs. 77-79).

u) Implied expected rates of return for any DDM assume an efficient market in establishing prices. In the case of single-stage model, the implies expected rate r = yield + growth; for 2-stage and 3-stage, trial and error is used; for H-model, use equation: r = (Do/Po) [(1 + g) + H(gs – gt)] + gt (Equat. 2-28, pg 81); and for the spreadsheet model, analyst can assume any pattern of dividend payments.

v) Use of the H-model is shown on page 81 (bottom of page).

w) Strengths of multistage model are that they: (1) can accommodate a variety of patterns of future expected dividends, (2) can provide useful approximations, (3) can be used to estimate implied expected rate of return as the rate that equates the present value of the dividend stream to the current stock price, (4) require analyst to carefully examine assumptions, (5) are applicable to spreadsheets, and (6) require a systematic approach to valuation. Weaknesses include: (1) garbage in, garbage out, (2) models can become complex, (3) models are sensitive to small changes in inputs, and (4) programming in spreadsheets prone to mistakes.

x) Sustainable is the rate of dividend (and earnings) growth that can be sustained for a given level of return on equity, keeping the capital structure constant over time and without issuing additional common stock.

y) Sustainable growth g = b X ROE, where b equals earning retention rate.

z) According to the Dupont model, g = retention rate X Net Income/Sales X Sales/Assets X Assets/Equity

aa) DDMs can be used in the portfolio management process in three steps: (1) planning, (2) execution, and (3) feedback. In the planning stage, risk and return objectives are set. In the execution stage, the portfolio manager selects the portfolio, and the trading desk implements the portfolio decisions. In the feedback stage, the portfolio manager evaluates the process and reports results to the client. Two risk control techniques could be either active or passive in style. If active, manager would identify degree of under or over allocation for a sector relative to benchmark. If passive, manager would insure that sector allocations are consistent with sector allocations in benchmark.

Stowe, et al., "Free Cash Flow Valuation," Ch. 3.

LOs
*a) Free cash flow to the firm is the cash flow available to the company's suppliers of capital after all operating expenses including taxes have been paid and necessary investments in working capital (e.g., inventory) and fixed capital have been made. (**Interest is not subtracted**.) Free cash flow to equity is the cash flow available t the company's common equity holders after all operating expenses, interest, and principal payments have been paid and necessary investments in working and fixed capital have been made. (**Interest is subtracted**.)*

b) Dealing with free cash flow is more challenging than dealing with dividends because the analyst must integrate the cash flows from the company's operations with those from its investing and financing activities. Because FCFF is the after-tax cash flow going to all investors in the firm, the value of the firm

is found by discounting FCFF at the weighted-average cost of capital (WAAC). The value of equity is then found by subtracting the value of debt form the value of the firm. FCFE is the cash flow going to common stockowners, so the appropriate risk-adjusted discount rate for FCFE is the required rate of return on equity.

c) Major weakness of FCFE model is that the data are not published and readily available. Major strength is that it uses discounted cash flow.

d) The ownership perspective implicit in the FCFE approach is that the investor can control the company (or expects another investor to do so), which means that dividends can be changed. The DDM does not take this perspective, but accepts whatever dividends the company pays as a given.

e) FCFF = Net income available to common shareholders + Net noncash charges + Interest expense (1-t) l Investment in fixed capital – Investment in working capital. FCFE = FCFF – Interest (1-t) + Net borrowings.

f) Under US GAAP, interest expense paid to a debt capital providers must be classified as part of cash flow from operations, although payment of dividends to equity capital providers is classified as a financing activity. International Account standards (IAS), on the other hand, allow the company to classify interest paid as either an operating or financing activity. Further, IAS allow dividends paid to be classified as either an operating or financing activity.

g) Approaches to forecasting cash flow include historical data assuming some constant growth rate. A more complex approach is to forecast the components of free cash flow (see example top of page 135).

h) If all the inputs were know and mutually consistent, a dividend discount model and a FCFE model would result in identical valuations for a stock. Generally, FCFE and dividends will differ. FCFE recognizes value as the cash flow available to stockholders even if it is not paid out in dividends. The company's board of directors, because of it s discretion over dividends, can choose to pay dividends that are lover or higher than FCFEw. Generally, however, the same economic forces that lead to low (high) dividends lead to low (high) FCFE.

i) Dividends, share repurchases, share issues, and changes in leverage have little affect on FCFF and FCFE (pgs 138-139). FCFF and FCFE are the cash flows available to investors or to stockholders, dividends and share repurchases are uses of these cash flows. Thus, transactions between the company and its shareholders do not affect free cash flow.

j) As a proxy for cash flow, net income ignores non-cash items, which are important. EBITDA is a poor proxy for FCFF because it does not account for the depreciation tax shield and the investment in fixed capital and working capital, but it is an even poorer proxy for FCFE.

k) The single-stage model assumes cash flows grow at a constant rate forever. The 2-stage model assumes growth rate in the second stage is a long-term sustainable rate forever. The 3-stage model assumes a constant growth rate for each stage. Be careful to recognize that multi-stage models can assume a declining rate of growth in any stage prior to the final stage.

l) Selection of a specific model depends on the company's stage in its product life cycle. Multi-stage models are appropriate for a company in any product life stage other than the mature stage, which requires a single-stage model.

m) Single-stage example (page 118); 2-stage example (page 149); and 3-stage (page 149).

n) Electronic spreadsheets allow sensitivity analysis for any growth model simply by changing the inputs of the model.

o) The terminal value may be estimated using a price multiple or a single-stage model.

p) If a company's capital structure is relatively stable, FCFE is more direct and simpler to use than FCFF. In the case of a levered company with negative FCFE, however, working with FCFF to value stock may be easier.

Study Session 11, "Asset Valuation: Equity Investments: Valuation Models and Applications"
Stowe, Robinson, Pinto and McLeavey, Analysis of Equity Investments: Valuation, "Market-Based Valuation: Price Multiples," Ch. 4.

LOs
a) The method of comparables involves using a price multiple to evaluate whether an asset relatively fairly valued, relatively undervalued, or relatively overvalued when compared to a benchmark value of the multiple. The method based on fundamental forecasts uses price multiples based on fundamentals through a DCF model.

b) A justified price multiple is an estimated fair value of that multiple with justification based on the method of comparables or the method based on forecasted fundaments.

c) For P/e: Earnings power is a chief driver of investment value, as reflected in the E of the P/E ratio; The P/E ratio is widely recognized and used by investors; differences in P/Es may be related to differences in long-run average returns, according to empirical research. Against P/E: EPS can be negative, and the P/E ratio does not make economic sense with a negative denominator; the ongoing or recurring components of earnings are the most important in determining intrinsic value; Management can exercise its discretion within allowable accounting practices to distort EPS as an accurate reflection of economic performance.

d) A stock's training P/E is its current market price divided by the most recent four quarters' EPS. T he leading P/E is a stock's current price dividend by next year's expected earnings.

e) Underlying earnings exclude nonrecurring components (see example 4-1, page 185).

f) Normalized EPS are earnings in which one-time or nonrecurring items have been removed from earnings. Two methods are: (1) use of historical average where EPS are calculated as average EPS over the most recent full cycle and (2) method of average return on equity where EPS is calculated as the average ROE from the most recent full cycle, multiplied by current book

g) Earnings yield equals E/P, which takes care of negative earnings since P is always positive. Negative E renders P/E ratio unusable.

h) Fundamental factors that affect P/E are growth rate, stock's required rate of return, and dividend payout ratio.

i) See example 4-7, page 192 for forecasted fundamentals

j) Cross-sectional regression summarizes a large amount of data in a single equation and can provide a useful perspective on valuation.

k) The advantage of comparables is that this approach is consistent with the idea of similar assets should sell at similar prices (see Example 4-10, page 197).

l) The PEG ratio is calculated as the stock's P/E divided by the expected earning growth rate. Stocks with lower PEGs are more attractive than stocks with higher PEGs. All else equal (page 198).

m) Multiples can be used to calculate terminal value by multiplying an estimated multiple (perhaps derived from comparables) by the projected earnings or book value (see Ex 4-17, pg 206).

n) To calculate P/B or P/S, you need to calculate Book value per share or Sales per share.

o) Arguments for use of P/B are several: BVPS is generally positive when EPS may be negative, BVPS is more stable than EPS, BVPS seems more appropriate for valuing companies composed chiefly of liquid assets, BVPS is also appropriate for not "going concern" companies, and differences in P/B may be attributed to differences in long-run average returns. Arguments against are also several: BVPS ignores human capital, P/B can be misleading when significant differences exist among the level of assets used by companies being evaluated, accounting practices may distort fair comparisons, and accounting standards in difference countries usually presents problems for comparison purposes.

p) Fundaments that affect P/B and P/S are profit margins, dividend payout ratios, and earnings growth rates (see EX 4-21, page 215 and Ex 4-25, pg 220).

q) Same as p)

r) Same as p)

s) Earnings-plus-non-cash- charges (CF) and cash from operations (CFO) are approximations not to be confused with the accounting definition of cash flow. Because the amount of capital expenditures as a fraction of CFO will generally differ among companies, the analyst may find that rankings from P/CF will differ from rankings by P/FCFE. Also, FCFE can be more volatile than CFO.

t) See Examples pages 226-227.

u) Advantages of using CF: cash flow is less subject to manipulation by management than earnings, CF is generally more stable than earnings, and price to CF is generally more stable than P/E, price to CF rater than P/E addresses the issue of differences in accounting conservatism between companies, differences in price to CFA may be related to differences in long-run average returns. Disadvantages are: When the EPS plus noncash charges approximation to cash flow from operation Is used, items affecting actual cash flow from operations, cash as noncash revenue and net changes in working capital, are ignored, and theory view free cash flow to equity rather than cash flow as the appropriate variable for valuation (pg 222).

v) Fundamental factors affecting CF rations are growth, required rate of return, and dividend payout.

w) See Ex 4-31, page 229.

x) Enterprise value (EV) is total company value minus the value of cash and investments. Because the numerator is enterprise value, EV/EBITDA is a valuation indication for the overall company rather than common stock.

y) See page 230.

z) Fundamental should be positively related to expected growth rate in FCFF and negatively related to the business's WACC.

aa) See Table 4-18, page 234.

ab) Trailing dividend yield is generally calculated as four times the most recent quarterly per-share dividend divided by the current market price per share. The leading dividend yield is calculated as forecasted dividends per share over the next year divided by the current market price per share.

ac) Arguments for using dividend yield: (1) it is a component of total return, and (2) dividends are a less risky component of total return than capital appreciation. Arguments against are that: (1) it is only one component of total return (not suing all information related to expected return is suboptimal), (2) dividends paid now displace earnings in all future period (Investors trade off future earnings growth to receive higher current dividends), and the relative safety of dividends presupposes that the market prices reflect in a biased way differences in the relative risk of the components of return.

ad) Fundamental factors affecting dividend yield are expected growth and the dividend payout ratio.

ae) See Ex 4-34, page 236.

af) Comparing companies across borders frequently involves accounting method differences, cultural differences, economic differences, and resulting differences in risk and growth opportunities.

ag) Momentum indicators relate either price or a fundamental such as earnings to the time series of their own past values, or in some cases to the fundamental 's expected value.

Stowe, et al., "Residual Income Valuation," Ch. 5.

LOs
a) Residual income deducts the estimated cost of equity capital, the finance concept that measure shareholders' opportunity costs.

b) EVA = NOPAT – (C% x TC), where NOPAT equals net operating profit after taxes, C% is the cost of capital and TC is total capital.

c) Residual income models have been found more useful than some other major present value models of equity value in explaining stock prices.

d) See Example 5-2, page 267.

e) See Examples 5-3 and 5-4, pages 267-269

f) In theory, the dividend discount and residual income models are mutually consistent. Uncertainty in forecasting distant cash flows, however, we may find that the earlier recognition of value in a residual income approach relative to other present value approaches is a practical advantage.

g) See page 270

h) See page 270

i) Fundamental drives are growth, required rate of return, and payout ratio.

j) P/B = (ROE – g)/(r – g) (see pg. 275).

k) The residual income model starts with a value based on the balance sheet, the book value of equity, and adjusts this value by adding the present values of expected future residual income. Thus, the recognition of value is different, but the total present value, whether using expected dividends, expected free cash flow, or book value plus expected residual income, should be consistent, in theory.

l) Because residual income model uses primarily accounting data as inputs, the model can be sensitive to accounting choices and aggressive accounting methods can result in errors in valuation (see page 278).

m) See Example 5-9, page 285.

n) Continuing residual income is residual income after the forecast horizon. Common assumptions are that residual income continues indefinitely at a positive level, is zero from the terminal year forward, declines to zero as ROE reverts to the cost of equity over time, and reflected the reversion of ROE to some mean level.

o) The longer the forecast period, the greater the chance that the company's residual income will converge to zero.

p) See Example 5-10, page 287.

Lee, HSBC Research (Malaysia) Sdn Bhd Company Report, "Star Cruises: Fair Winds for a Young Star."

LO—The candidate should be able to discuss the generic features of security analysis and the application of analytical techniques in the valuation of a company. This is the only LO listed for 2003. The following comments are from the 2002 LOs that should help you.
a) Factors that influence the leisure industry: *Economic revival in US and Europe driving demand; industry expansion driving supply although a small number of shipyards capable of building cruise ships on schedule, on budget and to specification will create a bottleneck to capacity growth industry-wide.*

b) Barriers to entry to the leisure industry: *Slowness in filling ship orders create barriers to entry that has limited competitive pressures in industry. Also, Asia's undeveloped market, relatively, poor cruise infrastructure, heterogeneous cultures and tastes will seem unattractive to the established cruise lines until established markets stagnate, or collapse due to some major event. The competitive threat is in established players committing a meaningful portion of capacity to Asia. This will not happen because of the following barriers:*
- No economies of scale in marketing—travel agents have exclusive agreement with Star.
- US lines may cannibalize home market customers—US lines would cut their own throats by cannibalizing home market
- Port and cruise infrastructure relatively undeveloped—Star is building jetties and terminals that gives the cruiser exclusive infrastructure in its areas of operation
- Asian customers' preference very different from US— a US cruiser attempting to re-locate a ship to Asia would require considerable advance planning

- Capital is a key barrier—building a new ship is very expensive

c) Methods used to value Star Cruises: *Various multiples including P/E trailing 12 and projected 12, PEG (P/E relative to growth rate), P/historic book and P/1999E book, and enterprise value relative to Ebitda were all used when comparing Star to Royal Caribbean and Carnival Lines.*

d) ROE components: *Projections for 1999: Ebit margin to increase, ATO to decline, Leverage to increase, interest burden to decrease, tax burden to decrease (be sure you understand these ratios--see Executive Summary for help).*

e) Comparison between Star and Royal: *EBIT/Sales for Star lower for 1998, but projected to exceed for 1999 and 2000, ATO lower for Star, leverage lower for Star, interest burden higher, and tax burden higher (be sure you understand these ratios--see Executive Summary for help).*

f) Critique of report: *The major criticism is use of comparables. Analyst using non-Asian lines (mostly Carnival and Royal Caribbean) as comparables is questionable. Also, the implicit assumption that global economic growth especially in Asia will continue is questionable.*

Study Session 12, "Asset Valuation: Equity Investments: Special Valuation Cases"
Pratt, Reilly, and Schweihs, Valuing a Business: The Analysis and Appraisal of Closely Held Companies, 3rd ed., "Minority Interest Discounts, Control Premiums, and Other Discounts and Premiums," Ch. 14.

The purpose of this chapter is to discuss the premium or discount applicable to a minority shareholder's holding. Be sure you recognize the base value to which the premium or discount is applied. For example, is the discount relative to the tangible asset value per share, or to the sum of tangible and intangible asset value per share? In other words, know the base value to which the discount or premium applies. Also, recognize that the control premium is the same as the minority discount. They just reflect a different perspective. Finally, the key to this chapter is the following table:

Value of control shares	$10
Value of minority shares if freely traded in market	$6
Value of nonmarketable minority shares	$3.60

The $10 value represents a control premium of $4, which equals a 66 2/3% increase over $6 (4/6 = 66 2/3%); the $6 value represents a minority discount of $4, which equals a 40% decrease from the $10 value (4/10 = 40%). The $3.60 value represents a lack of marketability of $2.40, which equals a 40% decrease from the $6 (2.40/6 = 40%). Together, the combined discount is $6.40, which equals a 64% decrease from the $10 value. Understand these concepts thoroughly for the exam.

Why is there a control premium? Because the controlling owner can make important decisions such as the dividend policy of the firm. The reverse logic is the reason for the minority discount.

What is the Market Evidence Regarding Control Premiums and Minority Interest Discounts? One study suggested premium between 30% and 40%, but it also depends on level of overall stock market. Another study stated the volume prior to observed changes is important.

What is Appropriate Discount from Net Asset Value? Be sure to recognize that net asset value may be defined differently. For example, net asset value for an REIT is different from net asset value for a real estate operating company since stockholders essentially control the dividend decision via legislation of an REIT, but do not for the operating company. Also, be sure to know whether the discount includes

both minority interest and lack of marketability (as with a limited partnership), or just minority interest. Finally, recognize that a parcel of land may not be divisible. This could make the fractional interest of one owner less than his proportionate share of the whole.

What Other Discounts are Possible? You may see a discount for B shares (restricted voting privileges) relative to A shares (full voting privileges), a discount for selling a large block of shares, a discount for the death of a key person, or a discount for the sale of a company that is overly diversified (unrelated investments that have less value to a potential buyer).

LOs
a) With control, investor has complete freedom to change the way company does business and perhaps increase its value significantly.

b) factors affecting the magnitude of a given control premium are: the nature an magnitude of nonoperating assets, ant nature and magnitude of discretionary expenses, the perceived quality of existing management, the nature and magnitude of business opportunities which are not currently being exploited, and the ability to integrate the acquiree into the acquiror's business or distribution channels.

c) the position of the minority shareholder is at a distinct disadvantage compared to the controlling shareholders.

d) All 5 valuation approaches discussed impact the control premium/minority discount to some degree: (1) the control premium in the income approach depends on the ability of a control owner to enhance projected income, (2) the capital market guideline approach, which looks at publicly traded shares as a standard, suggests that market conditions impact a control premium, (3) the merger and acquisition method suggests that if an indication of value is developed based on merger and acquisition data, a control premium generally would not be appropriate, (4) the asset accumulation method states that if the full value of all intangible assets is fully reflected in the asset-based valuation approach, then minority share typically sell at a minority discount from such value, (5) the excess earnings method says that when considering whether a control premium or minority discount should be applied, you must consider whether or not prerogatives of control have been reflected in the projected income.

e) The applicable standard of value depends on the purpose of the valuation that fall within one of four categories: (1) fair value—price at which an arm's length transaction would be expected to occur between normally motivated investors under open market conditions, (2) investment value—value to a particular investor considering that investor's cost of capital, perception of risk, and other unique characteristics, (3) intrinsic value—is the value inherent in the characteristics of the investment itself, (4) Fair value—although not consistently define, most often arises as the statutory standard of value applicable to appraisals under dissenting stockholders' rights or rights to dissolution. The selection impacts discounts or control premiums (1) Fair value results in a large minority discount. (2) Premium or discounts for investment value are indeterminate. (3) Intrinsic value usually results in a control premium. (4) Fair value premiums or discounts depend on legal precedent.

f) State statue provisions affecting <u>minority stockholders' rights vary greatly from state to state</u> and are categorized into one of three possibilities: (1) requirement for supermajority votes—some states require a simple majority approval for major actions such as a merger, but other states require two-thirds majority approval, (2) dissenting stockholder appraisal rights—most states have statues allow minority stockholders to dissent if a company undergoes a major action such as a merger in which case the dissenters' remedy is to have their shares appraised and be paid that value in cash. (3) rights to dissolution or sale of stock—few states have statues enabling minority shares aggregating some specific percentage of the total outstanding to petition the courts to force dissolution of the firm.

g) The top-down approach is based on the proportion of the enterprise value (pro rata interest in the total) less discount, if applicable, (2) horizontal approach is a direct comparison with sales of other minority interests, which is widely accepted by courts (3) bottoms-up approach starts with nothing and builds up. All impact minority interests since all consider minority values.

h) According to a study, premium should be between 30% and 40%, but overall stock market level and volume prior to observed changes is also important.

Self test question: Assuming a $10 value for controlling shares, **calculate** and **explain** the control premium if the stock is selling for $6 in the open market. **Calculate** and **explain** the lack of marketability discount if the price of nonmarketable minority shares is $3.60.
Suggested answer: The $6 value represents a control premium of $4, which equals a 66 2/3% increase over $6 (4/6 = 66 2/3%), or a minority discount of $4, which equals a 40% decrease from the $10 value (4/10 = 40%). The $3.60 value represents a lack of marketability of $2.40, which equals a 40% decrease from the $6 (2.40/6 = 40%). Together, the combined discount is $6.40, which equals a 64% decrease from the $10 value. Understand these concepts thoroughly for the exam.

Pratt, Reilly, and Schweihs, "Discounts for Lack of Marketability," Ch. 15, pp. 331-334, 342-359.

The purpose of this chapter is to continue with the discussion of chapter 14. Specifically, the concept of discounts for marketability for both minority interests and controlling interests is addressed. In this chapter, be careful to recognize that the terms liquidity and marketability are being used interchangeably. In other required readings, this may not be the case.

Benchmark for Discount for Lack of Marketability for Minority Interests. The evidence presented here is based on the difference between actively traded public securities and letter stock, which is identical in all respects to actively traded stocks except it is restricted from trading on the open market for a certain period (usually 24 months). Companies issue letter stock when raising capital quickly without registering with the SEC. Be sure to recognize three terms: (1) letter stock, (2) publicly traded stock, and (3) closely-held stock. The summary shows differences between (1) and (2) between 40% and 63%.

One study, the Willamette Management Associates Studies, adjusted the discount for letter stock and publicly traded stock for an industry effect according to the following:

- [Po - Pp (Io/Ip)] / Po

where Po = price of public stock, Pp = price of private transaction, Io = industry price index at time of offering, and Ip = industry price index at time of private transaction. Be prepared to do this calculation on the exam. The P/E adjustment is

- [Po/Eo - Pp/Ep (IP/E / IP/Ep)] / P/Eo

Discounts for Lack of Marketability for Controlling Interests—such a discount is necessary for federal estate tax purposes and divorces. The major marketability factors affecting controlling interests include
- time horizon—it takes much time to sell a controlling interest of a closely held corporation
- cost—it is costly in legal fees and transaction fees
- risk—thin markets makes transactions risky
- form of proceeds—often the proceeds are in non-cash (i.e., note)

- inability to pledge asset—banks may not take stock as collateral

Benchmark for the Discount for Lack of Marketability for Controlling Interests—you would think that the fair market value of a similar stock is the appropriate benchmark from which to measure the discount, but new issues incur many other expenses that distort this benchmark such as underwriting commissions.

Differences between Private and Public Company Acquisition P/E Multiples—evidence presented show P/E ratios of publicly traded stocks significantly larger than the P/E ratios of privately transacted stocks. The difference may be explained by (1) publicly traded stocks are better known, (2) they have audited financial statements, and (3) larger firms have traditionally had higher P/E ratios than smaller firms (size effect).

Factors that Affect the Discount for Lack of Marketability:
- put options—often found in ESOP-owned stock
- stocks that pay low or no dividends are usually less marketable
- the lack of potential buyers
- large blocks of stocks have greater discounts
- information is not easily available to minority owners
- many closely held stocks are restricted from trading

Court Decisions on Discounts for Lack of Marketability—the trend is toward greater discounts.

LOs
a) Marketability is the relative ease and promptness with which a security or commodity may be sold when desired, at a representative current price, without material concession in price merely because of the necessity of sale. Liquidity is the amount of time required to convert an asset into cash or pay a liability. For noncurrent assets, liquidity generally refers to marketability. In economics, liquidity is the desire to hold assets in the form of cash. The marketability concept deals with the liquidity of the shareholder interest. It is the ability to convert the property to cash quickly with minimum costs with an expected amount of the net proceeds. In a liquid market, firms can raise capital easily, and investors pay higher premium for the higher liquidity. I think of liquidity as protection of principal (i.e., T-bills), and marketability as the ease of transacting but not necessarily protecting principal (i.e., IBM).

b) Average differentials between private transaction prices and public market prices varies under different market conditions. The fair market values of minority ownership interests in privately held companies are greatly discounted from their publicly traded counterparts.

c) Transactional data show that private transaction prices differ from public market prices by 40 to 63 percent. Thus, market value of minority ownership interests in privately held companies are greatly discounted from their publicly traded counterparts.

d) major factors affecting the discount for lack of marketability include:
- *put options—often found in ESOP-owned stock*
- *stocks that pay low or no dividends are usually less marketable*
- *the lack of potential buyers*
- *large blocks of stocks have greater discounts*
- *information is not easily available to minority owners*
- *many closely held stocks are restricted from trading*

Self test question: Calculate the discount of a stock trading at $10 per share in the open market if the recent private transaction price was $4, the industry price index at time of offering was 77, and the industry price index at the time of the private transaction was 70.
Suggested answer: [10 - 4(77/70)] / 10 = 56%

Gardella, Readings in Venture Capital, "Selecting and Structuring Investments: The Venture Capitalist's Perspective"

Investment strategy. A venture capitalist should be experienced, proactive, disciplined, have a prudently flexible investment strategy, and have sufficient capital resources. Investment strategy of venture capitalist should focus on the investment activities of the industry, stage of development, financing stage, and geographical region.

Deal flow generation. Gardella defines the deal flow as the investment opportunities generated by the venture capital firm. There are three main sources of deals: referrals, direct prospecting, and company management. Referrals come from networking or current clients; direct prospecting is a proactive process identifying companies that plan to raise venture capital.

Screening. Screening is a method by which the venture capitalist decides how the deal fits in the portfolio's overall strategy, the potential return for the deal, and the source of the deal.

Due diligence: The venture capitalist must go through a due diligence process for the purpose of clearly understanding the business model and the major risk factors involved.

Due diligence activities. During due diligence process, the venture capitalist interviews management of the potential firms to understand the company culture, tries to understand the customer's level of satisfaction with the company's services and products, tries to learn the specifics of the company's industry, analyzes the character of the management through the personal references, examines the vendor relations of company, attends industry trade shows to learn more about the industry (in terms of buyers, suppliers and competitors, develops return and valuation models), examines financial status of the company and any legal issues in which the company is involved, and examines the efficiency of internal communication within the company.

Due diligence topics. The primary purpose of the venture capitalist during the due diligence process is to find out the real (true) value of the company. Among the various valuation methods, two methods are most commonly used: (1) comparable companies, and (2) multiple scenarios.

Valuation. Valuation of companies in an early stage of development are more likely to be based on revenue, and valuations for companies in later stages of development are more likely to be based on earnings and cash flow. In multiple scenario technique, valuation of the prospective company is calculated for different scenarios of growth and profitability expectations: expected (most likely), optimistic, and pessimistic scenarios. After calculating the valuation criteria for each scenario separately, data for different scenarios are blended to obtain a single valuation estimate. Finally data obtained on the prospective company are compared with the industry multiples (averages).

Investment structure. Investment structure of the company should reflect both the entrepreneur's objectives and the venture capitalist's objectives. Usually, the entrepreneurs' main concern is not to lose ownership (or control) of the company, and to maximize upside potential. The venture capitalist's objective is to find a flexible investment structure that will allow additional investment in the company

for more control in the event of liquidation. Usually, the venture capitalist likes to protect his investment through convertible preferred stock which is senior to and convertible to common stock.

LOs
a) There are three main sources of deals: referrals, direct prospecting, and company management. Referrals come from networking or current clients, direct prospecting is a proactive process identifying companies that plan to raise venture capital.

b) During due diligence process, the venture capitalist interviews management of the potential firms to understand the company culture, tries to understand the customer's level of satisfaction with the company's services and products, tries to learn the specifics of the company's industry, analyzes the character of the management through the personal references, examines the vendor relations of company, attends industry trade shows to learn more about the industry (in terms of buyers, suppliers and competitors, develops return and valuation models), examines financial status of the company and any legal issues in which the company is involved, and examines the efficiency of internal communication within the company. Without due diligence, the venture capitalist would not understand the industry, stage of development, financing stage, or geographical region of the firm.

c) Several issues include return expectations (IRR), development stage of the company, the valuation of industry comparables, the financial history of the company, the liquidity of the investment, the amount of influence that can be exercised by the venture capitalist, and future dilution.

d) Investment structure of the company should reflect both the entrepreneur's objectives and the venture capitalist's objectives. Usually, the entrepreneurs' main concern is not to lose ownership (or control) of the company, and to maximize upside potential. The venture capitalist's objective is to find a flexible investment structure that will allow additional investment in the company for more control in the event of liquidation. Usually, the venture capitalist likes to protect his investment through convertible preferred stock, which is senior to, and convertible to common stock.

Self test question: **List** several steps a venture capitalist will take when exercising due diligence.
Suggested answer: (1) management interviews, (2) customer references, (3) third party analysis, (4) personal references, (5) vendor references, (6) industry trade shows, (7) customer visits, (8) financial analysis, (9) legal issues, (10) internal communication.

Study Session 18, "Portfolio Management: Capital Market Theory and Asset Pricing"
Reilly and Brown, Investment Analysis and Portfolio Management, 6th ed., "An Introduction to Portfolio Management," Ch. 8.

An Efficient Portfolio is one that generates the highest possible expected return for a given level of risk, or the lowest possible risk for a given level of expected return. Modern portfolio theory assumes investors are risk averse.

Markowitz Portfolio Theory—his main contribution was the quantification of risk, as measured by standard deviation of portfolio. Covariance is focus.

Alternative Measures of Risk: (1) standard deviation, (2) range, (3) semi-variance—measure of dispersion that considers only outcomes below expected return

Expected Rates of Return --a simple weighted average

<u>Variance (Standard Deviation) of Returns</u>--not a weighted average of standard deviations of securities in portfolio, but depends on covariance (interaction) of securities within portfolio

<u>Covariance of Returns</u>—measure of degree to which two random variables move together

<u>Covariance and Correlation</u>—related in that both have same sign, but correlation has boundaries (-1 < R < 1.0) whereas covariance does not. Also note that beta has same sign as correlation and covariance.

<u>Standard Deviation of a Portfolio</u>—as securities are added to portfolio, the weighted average of standard deviations of individual securities becomes less important and covariance becomes more important.

The Two-Asset Portfolio:
Equal Risk and Return - Changing Correlations—the result of this is a more efficient frontier. Be sure you can draw this effect. In other words, know what happens to the risk of the portfolio as you change the correlations keeping expected return constant. One portfolio dominates another if it is more efficient. Changing Weights—having a correlation equal to -1.0 is not by itself sufficient to generate a riskless portfolio. You must also have the proper weights assigned to each asset. Thus, the perfectly riskless portfolio depends on two items: (1) correlation of -1.0 and (2) selection of proper weights. Software programs use trial and error to generate the efficient frontier given three estimates: (1) expected returns, (2) correlations, (3) standard deviations

If portfolio contains a large number of securities, the standard deviations of the individual securities in the portfolio disappear. That is, micro risk (unsystematic) is diversified away.

<u>The Efficient Frontier and Investor Utility</u>—an investor's <u>optimal</u> portfolio is the one generated where the investor's utility function touches the efficient frontier. The optimal portfolio will differ among investors depending upon their utility functions, which will affect the point of tangency. A more risk adverse investor's optimal portfolio will be closer to Rf and a more risk taking investor's optimal portfolio will be further away from Rf. An indifference curve depicts the set of expected returns and levels of portfolio risk (standard deviations) of which the investor is indifferent. In other words, the investor is satisfied with any combination of expected return and risk on an indifference curve. The utility function describes the location of the investor's indifference curve relative to the efficient frontier.

LOs
a) Risk aversion means that given a choice between two assets with equal rates of return, investors will select the assets with lower level of risk. Therefore, there is a positive relationship between expected return from an investment and expected risk of that investment. The clear implication for the investment process is this positive relationship.

b) In stand-alone analysis, all the following are important: (1) standard deviation, (2) range, (3) semi-variance—measure of dispersion that considers only outcomes below expected return. In a portfolio context, covariance, correlation, and the weights of each asset in the portfolio are the most important factors to consider. In both contexts, market performance (M) plays an important role.

c) The variance equals the weighted average of the squared deviations around the expected value. The weights equal the probability of a return occurring. The standard deviation equals the square root of the variance.

d) as securities are added to the portfolio, the weighted average of standard deviations of individual securities becomes less important and the pairwise covariances become more important (see "The Two-Asset Portfolio" above and be sure you understand these concepts for the exam).

e) Expected return is the weighted average of expected return of the individual assets. Portfolio variance is the weighted average of individual variances plus weighted covariances between all the assets in the portfolio. The key to modern portfolio theory is covariance (see discussion in Executive Summary).

f) Cov has no boundaries meaning that its value ranges from minus infinity to plus infinity. It is, therefore, difficult to interpret. Covariance (AB) = correlation (AB)/ (standard dev of A x standard deviation of B). Corr (AB) = Cov (AB) x Standard Dev (A) x Standard Dev (B). Unlike covariance, correlation is bound by –1 to +1. These boundaries make interpretation of correlation much easier than for covariance.

g) In a large portfolio, the necessary statistical inputs for use of the Markowitz model include standard deviations for each asset, the weighting of each asset, and the correlations or covariances of each possible pair of assets, which is practically impossible to generate. This impossible task led to the development of the CAPM where the beta of each asset with the market portfolio eliminates the need for each pairwise correlation.

h) The efficient frontier is a graphical representation of efficient portfolios (those with the highest return for a given level of risk or the lowest risk for a given level or return). The efficient frontier is concave (downward sloping) on a two-dimensional graph. On the same two-dimensional graph of return and risk, the investor's utility curve is upward sloping meaning that the investor requires increasing amounts of expected return for each additional unit of risk taken. An investor selects his optimal portfolio by selecting his/her level of risk and observing the portfolio associated with that level of risk. This process is also called the "separation theorem," since the efficient frontier and utility functions are separate decisions.

Reilly and Brown, "An Introduction to Asset Pricing Models," Ch. 9

This chapter builds on the prior two chapters for the purpose of showing the importance of the market portfolio M, which Sharpe derived. M is the main concept of this chapter. Recognize its importance.

All Investors are Markowitz Efficient Investors: (1) You can Borrow or Lend at the RFR, (2) Homogeneous Expectations, (3) Same One Period Time Horizon, (4) Investments Infinitely Divisible, (5) No Taxes or Transactions Costs, (6) No Inflation, (7) Capital Markets are in Equilibrium

The Initial Development- be sure to recognize that the Sharpe efficient frontier (year of 1964: straight line) came after the Markowitz efficient frontier (year of 1952: curve) because the Sharpe frontier includes Rf.

A Risk-Free Asset: (1) What is it? It has no risk over the period (i.e., one year). This is why the One Period Time Horizon assumption is important, (2) Covariance with the Risk-Free Asset—the covariance of any risky asset with Rf is zero, (3) Combining the Risk-Free Asset and a Risky Portfolio—the result is a new portfolio whose risk is proportional to the risk of the risky asset. In other words, the new portfolio lies on a straight line drawn between the risky asset and Rf, (4) Expected Return of the new portfolio is also on the straight line. If the risky portfolio contains all securities in the market, this risky portfolio is the market portfolio M and the line is called the Capital Market Line (CML). Portfolio combinations lying between Rf and M are lending portfolio because you are lending

money to the government at Rf, and portfolios lying beyond M are borrowing portfolio because you are borrowing money at Rf (you are leveraged) This is why the Rf rate assumption is so important.

The Market Portfolio M includes <u>all</u> assets proportional to the market value of the asset to the total market value of M. M is perfectly diversified meaning it has eliminated all unsystematic risk.

The CML and Separation Theorem - investment and financing decisions are separate. Be sure to recognize this important concept. In other words, draw the Sharpe efficient frontier first, and then draw your indifference curve that reflects your level of risk. These two acts are separate (independent), and the intersection of the two is your optimal portfolio.

Risk Measure for the CML—recognize that the CML includes M, which is perfectly diversified. Thus, any combination of Rf and M contains only systematic risk. The unsystematic risk is not relevant in a <u>perfectly</u> diversified portfolio.

The CAPM—The Security Market Line (SML) reflects the relationship between expected return and systematic risk (beta) for any security or portfolio. Recognize the difference between the CML (risk = standard deviation), and SML (risk = beta). You can derive the SML by measuring the relationship between all securities in the market and M (beta of each security), ranking all the betas from high to low, and drawing the line that depicts this relationship. The intercept of the SML is Rf (zero beta). In equilibrium, all securities plot on the SML. Any security that plots off the SML is mispriced, and represents an investment opportunity of either buying it or selling it short. Recognize that different firms calculate different betas because they may use different holding periods (i.e., one week or one month), different time periods (5 years from 1990 to 1995 or 5 years from 1989 to 1994), or different market indices (S&P 500 or Dow Jones Industrial Average). Theory does not address these issues since we are estimating the future and these issues are concerned with historical data.

Arbitrage Pricing Theory (APT)—was developed by Ross mainly because M cannot be measured. Thus, we do not know if its proxy (i.e., S&P 500) lies on the efficient frontier. It probably does not. APT differs from CAPM in that it does not require; (1) investors to have a quadratic utility function, (2) security returns be normally distributed, (3) identification of the market portfolio M

Think of APT as a multi-factor model, and the CAPM as a single factor Model (beta, which reflects the impact of M, is the single factor). The problem with APT is that it does not tell us the factors that affect a security's returns. We must estimate these factors using empirical analysis. Empirical Tests of APT show it superior to CAPM in estimating expected returns.

LOs
a) Risk free asset has no risk over the assumed period. The covariance of any risky asset with risk free asset is zero. If you combine the risk free asset and a risky Markowitz portfolio, the new portfolio lies on a straight line drawn between the risky asset and risk free asset. This is the Capital Market Line (CML).

b) The market portfolio includes all risky assets in the universe (excludes the Rf asset). The market portfolio lies on the efficient frontier and is the only risky portfolio in which investors should invest. Drawing a straight line from Rf to M defines the CML.

c) Systematic risk is defined as the variability in all risky assets caused by macroeconomics variables, remains in the market portfolio. Systematic risk cannot be eliminated. Unsystematic risk is all risk unique to individual assets, and can be diversified away.

d) As the number of stocks in the portfolio increases, the total risk (standard deviation) declines at a declining rate. The decline is due to reduction of the unsystematic risk, which is diversifiable.

e) Security Market Line (SML) reflects the relationship between expected return and systematic risk (beta) for any security or portfolio. The difference between CML and SML is that CML uses standard deviation concept as risk and SML uses beta as risk.

f) The beta of a risky asset shows the relationship between that one asset and a well-diversified portfolio of risky assets. Beta = covariance (iM) / Variance M. Alternatively, it is the slope of the characteristic line.

g) Any security that is above or under SML is undervalued or overvalued, respectively. In equilibrium, all expected returns plot on the SML, which identifies required returns.

h) Major assumptions of APT include: (1) capital markets are perfectly competitive, (2) investors always prefer more wealth to less wealth with certainty, and (3) the stochastic process generating asset returns can be represented as a K factor model. The CAPM requires a large number of investors who act efficiently in the pricing of assets. That is, if the market presents a mispriced security, these investors will immediately recognize the mispricing and take action to correct the situation. The CAPM also requires the existence and identification of the market portfolio, M. The APT requires that only one investor identify a mispriced security who, through his/her own actions of buying and selling, can correct the mispricing. The APT does not require the existence and identification of the market portfolio, M. It does, however, require identification of the factors that drive the price of a security. The CAPM is a single factor model with that factor theoretically identified as being the market portfolio, M; APT is a multifactor model that depends on empirical analysis to identify the factors. The SML is the CAPM. In equilibrium, all securities plot on the SML. Any security that plots off the SML is mispriced, and represents an investment opportunity of either buying it or selling it short. APT was developed by Ross mainly because M cannot be measured. Thus, we do not know if its proxy (i.e., S&P 500) lies on the efficient frontier. It probably does not. APT differs from CAPM in that it does not require; (1) investors to have a quadratic utility function, (2) security returns be normally distributed, (3) identification of the market portfolio M. Think of APT as a multi-factor model, and the CAPM as a single factor Model (beta, which reflects the impact of M, is the single factor). The problem with APT is that it does not tell us the factors that affect a security's returns. We must estimate these factors using empirical analysis. Empirical Tests of APT show it superior to CAPM in estimating expected returns.

Reilly and Brown, "Extensions and Testing of Asset Pricing Theories," Ch. 10.

This chapter presents various empirical test of the CAPM, relaxes some of the critical assumptions of the model and leads into the APT. The main purpose is to show that the real world does not conform nicely to any theory. The problem is in developing a model that accurately measures risk.

Relaxing the Assumptions: The real world has:
- Differential borrowing and lending rates
- Positive transaction costs
- Heterogeneous expectations and planning periods
- Positive taxes

The CAPM assumes away all of these items.

A. Empirical Tests of the CAPM are mainly concerned with
- Stability of beta—different estimation methodologies generate different beta estimates
- Individual stocks vs. Portfolios—portfolio betas more stable than betas of individual stocks
- Effect of time is important (i.e., estimation period 12 months or 48 months)
- Effect of volume—small firms have different betas than large firms
- Comparability of published estimates of beta—Merrill Lynch betas differ from Value Line betas
- Linearity of the relationship between expected return and beta as suggested by SML
- early evidence was in favor of the CAPM even though intercepts were higher than expected
- Other variables such as size, P/E, leverage and B/P were discovered that could explain what beta could not

Fama and French found no evidence that beta explains returns even when used alone.

The bulk of evidence regarding the relationship between rates of return and systemic risk for portfolios indicate support for the CAPM, while the relationship for individual stocks have not been supportive.

The Market Portfolio: Theory versus Practice—a proxy (benchmark) for M does not exist. Using different proxies results in different test results. Arbitrage Pricing Theory (APT) was developed as a result of problems with CAPM.

B. Empirical Tests of the APT
Roll-Ross Study—provided weak support for APT. Extensions of the Roll-Ross Tests—also found weak support

The APT and Anomalies—results of these tests showed
- a small firm effect
- a January effect

The Shanken Challenge to Testability of the CAPM—Shanken showed that tests of the APT could not prove it wrong since the model does not specify the factors to test.

LOs
a) Accuracy of the SML is unknown when these factors are considered since the linearity assumption most likely no longer holds.

b) Individual betas are very unstable due to the changing nature of a firm. Portfolio betas are more stable since diversification in a portfolio reduces the estimation error associated with individual betas.

c) Major estimation problems for beta include its instability over time, whether a linear relationship between an asset and the market portfolio actually exists, and measurement of the market portfolio, M.. Another problem is the period over which to measure returns: one week, one month, or something else?

d) A benchmark error occurs when the proxy for the market portfolio contains errors that cannot be measured. Theoretically, the market portfolio, M, includes all risky assets. In practice, the proxy usually only reflects only a select portfolio of stocks, like the S&P 500. Roll says that M cannot be measured. Thus, performance measurement based on M includes an estimation error due to trying to estimate the unobservable M. This would be like trying to determine the winner of a football game where nobody knows how to keep score. The implication is that the CAPM is not testable.

e) APT assumes that there are multiple factors expected to have an impact on the returns of all assets. Examples of these factors might include unanticipated inflation, unanticipated growth in GNP, unanticipated major political upheavals, or unanticipated changes in interest rates. These factors must be empirically estimated. APT does not tell us what they are. APT also assumes that the multiple factors are independent and will be diversified away in a large portfolio. In contrast, CAPM assumes that the only relevant variable in explaining the return of a stock is the covariance of that stock's returns with the returns of the market portfolio, M. While CAPM identifies M as the only factor affecting the returns of a security, M is not measurable since it includes all risky assets in the universe. Both the CAPM and the APT are, therefore, not testable.

Self test question: **List** and **explain** 3 limitations of beta as a measure of risk.
Suggested answer: Beta estimates are unstable, the relationship between expected return and beta may not be linear, and there is no good proxy for the market portfolio M.

Bodie, Kane and Marcus, Investments, 5th ed., "The Process of Portfolio Management," Ch. 26.

LOs
a) There are three steps in the investment process: (1) identify investor's objectives, (2) identify all the constraints affecting the objectives, and (3) translating objectives and constraints into investment policies.

b) Portfolio objectives and constraints for individual investors are generally more qualitative and driven by the stage in the life cycle of the investor. Return requirement: In the early stage, investors are more concerned with college educations for their children. In the later stage, more concerned about retirement. Risk tolerance: younger investors are more risk tolerant than older investors. Portfolio objectives and constraints for institutional investors are more varied but generally are more quantitative and depend on the type of institution. The time horizon for institutions is usually very long-term or even infinite, which means more ability to assume higher levels of risk than individuals with the expectation of achieving higher returns.

c) Steps in the asset allocation decision are: (1) specify asset classes to be included in the portfolio, (2) specify capital market expectations, (3) derive the efficient portfolio frontier, and (4) find the optimal asset mix as the tangent point between the efficient frontier and the investor's utility function.

d) Taxes affect the asset allocation by the choice of asset classes (maybe tax deferred bonds rather than taxable bonds), the time horizon (taxes encourage longer holding periods, generally, in order to postpone the tax payment), and different treatment of dividends and capital gains. Taxes, therefore, make the asset allocation more difficult for taxable investors than for non-taxable investors.

e) An investor's life cycle stage can affect goal-setting mainly due to age. A younger person is usually more concerned with immediate family expenditures than saving. As the investor gets older earning more money, he/she can focus more on saving for retirement.

f) Defined contribution plans place investment risk on the employee since retirement benefits depend on investment performance. Defined benefit plans place investment risk on the employer since retirement benefits depend on a set formula regardless of the investment performance. Defined benefit plans have a longer time horizon than defined contribution plans and, thus, are more likely to employ growth-oriented assets like equities.

g) Shareholders might prefer to invest in bonds because it is commonly believed by investment professionals that the company is liable for pension asset short-falls but is not entitled for plan surplus. If this is true, then the company has an incentive to immunize plan liabilities using bonds.

Problems 1,12.